REMARKS

Claims 1, 5, 6, 7, 9 and 16 have been amended. Corresponding amendments have been made in claims 3, 9, 12, 13 and 14. New claim 17 has been added.

***Claim Rejections* - 35 *USC* § 112**

Applicant believes that the amended claims traverse the objections raised in the Office Action.

***Claim Rejections* - 35 *USC* § 103**

Claims 1 through 5, 9 through 13, 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Begley (US 6211056) in view of Howard (US 6396122). This rejection is respectfully traversed.

Applicant submits that the subject matter of these claims would not have been obvious at the time the invention was made to a person having ordinary skill in the art.

More particularly, as explained below in more detail, Applicant submits that one with ordinary skill in the art would not have combined the teaching of Begley with the teaching of Howard at the time the invention was made.

Furthermore, as explained below in more detail, Applicant submits that the combination of the teaching of Begley with the teaching of Howard does not teach each and every feature recited in the claims on file.

<u>One would not have combined Begley with Howard</u>

Applicant submits that the teaching of Begley is incompatible with the teaching of Howard and that one with ordinary skill in the art would not have combined the teaching of Begley with the teaching of Howard at the time the invention was made.

Begley teaches that (emphasis added):

> "A typical air bridge is formed using (...) a metal lead surrounded by air <u>rather than a dielectric</u>, such as oxide. The capacitances to the substrate and to other metal lead is thus reduced since air has a lower dielectric constant than do solid insulators such as silicon dioxide or silicon nitride." (col. 1 lines 25-32).

Begley teaches that (emphasis added):

> "In a normal process, a passivation layer is deposited on top of an integrated circuit. (...) [F]or air bridge structures, the passivation layer has to be omitted otherwise the passivation layer will fill the air under the bridge and thereby increase the capacitance of the air bridge or damage the bridge itself." (col. 1 lines 39-45)

In other words, Begley teaches that only air (apart from a sheath surrounding the lead) can fill under the bridge and explicitly excludes solid insulators from being suitable.

By contrast, Howard teaches a solid dielectric, see for example col. 3 lines 31-38:

> "a conductor is patterned in a dielectric. (...) The dielectric can be, for example, silicon oxide or a low-k dielectric. A spin-on matrix containing high permeability particles is then deposited adjacent to the patterned conductor."

and col. 6 lines 15-19:

> "high permeability particles are added to a flowable material such as hydrogen silsesquioxane ("HSQ"), or spin-on glass ("SOG"). Thus, the flowable material functions as a "spin-on matrix" comprising high permeability particles."

Thus, Howard teaches a conductor patterned in a dielectric with a spin-on matrix adjacent to the patterned conductor and that a component of the matrix is HSQ or SOG, both solid insulators with higher dielectric coefficient than air. To situate the conductor in a dielectric with a matrix comprising a solid insulator dielectric adjacent to the conductor as taught by Howard is incompatible with the teaching of Begley that the conductor should be surrounded by air without any solid insulator dielectric, apart from a supportive sheath.

Applicant submits that already for this reason, a person skilled in the art would not have adapted the teaching of Begley of a conductor surrounded by air to minimize capacitance, by the teaching of Howard.

Furthermore, Howard teaches a conductor with a spin-on matrix adjacent to the patterned conductor and that a component of the matrix is high permeability particles, supported in a flowable material. However, Begley teaches (col. 2 lines 19 to 22).:

"The air bridge structure comprises an elongated metal conductor that is encased in a dielectric sheath. At least a portion of the sheath is exposed to ambient atmosphere."

Begley also teaches:

"portions of the substrate or the dielectric layer, or both, are removed to expose the encased elongated conductor to air."

Thus, to combine the teaching of Begley with Howard, the dielectric (flowable material) of Howard has to be removed. This leaves the high permeability particles unsupported, in a conductive layer adjacent the conductor lead, which is clearly incompatible with Begley.

Moreover, to remove the entire matrix of Howard to leave the conductor lead surrounded by atmosphere as taught by Begley is clearly incompatible with Howard, whose teaching is that the inductance value should be increased for which the matrix is required, with high permeability particles in the flowable material.

For this reason as well, at the time that the present invention was made, a person skilled in the art would not have adapted the teaching of Begley of a conductor surrounded by air to minimize capacitance, by the teaching of Howard.

Combination of the teachings of Begley with Howard would not teach the features in the claims on file

Regarding claims 1 and 3

Claims 1 and 3, on file and as amended, recite: *"[a] method of producing an electrical circuit element comprising an elongate electrical conductor encircled by magnetic material extending along at least a part of said electrical conductor".*

Neither Begley nor Howard discloses a method resulting in an elongate electrical conductor encircled by magnetic material. Accordingly, the combination of Begley and cannot lead to the subject matter claimed in claim 1 or 3.

In Howard, the high permeability particles are deposited above and/or beside the conductor but not below the conductor. In Begley, the conductor leads are surrounded by a dielectric solid insulator sheath and by air but not by magnetic material.

As stated in the background section of the present application, encircling the conductor of an inductive element with a magnetic material can significantly increase its inductance or reduce its size while maintaining a constant inductance. Magnetic shielding is another property for which it is desirable to encircle an electrical conductor with magnetic material. No method of producing such a circuit element is disclosed in the prior art cited.

Claims 1 and 3, on file and as amended, further recite *"removing said liquid dispersant leaving said magnetic nanoparticles densely packed in said space"*. Neither Begley nor Howard discloses a method including removing liquid dispersant leaving magnetic nanoparticles densely packed in the space. Accordingly, for this reason as well, the combination of Begley and cannot lead to the subject matter claimed in claim 1 or 3.

Begley discloses that:

> "(...)portions of the substrate or the dielectric layer, or both, are removed to expose the encased elongated conductor to air."

Begley does not the use of magnetic nanoparticles at all and therefore does not disclose a feature corresponding to *"(...) leaving said magnetic nanoparticles densely packed",* as recited in claims 1 and 3.

Howard does not teach removing any component of the matrix and in particular does not teach removing the flowable material component of the matrix. Howard teaches (col. 3 lines 31-38):

> "A spin-on matrix containing high permeability particles is then deposited adjacent to the patterned conductor."

Howard further teaches (col. 6 lines 15-19):

> "high permeability particles are added to a flowable material such as hydrogen silsesquioxane ("HSQ"), or spin-on glass ("SOG"). Thus, the flowable material functions as a "spin-on matrix" comprising high permeability particles.

The flowable material, HSQ or SOG is not removed but remains as part of the matrix in the finished product, as shown for example in Howard's Figures 7A to 7C. Neither Figure 7C nor the passage at col. 8 lines 5-50 referred to in the Office Action

discloses removing liquid dispersant leaving magnetic nanoparticles densely packed in the space. Thus, Howard does not disclose a feature to *"removing said liquid dispersant leaving said magnetic nanoparticles densely packed in said space"* as recited in claims 1 and 3.

Neither Howard nor Begley discloses a method including "*removing liquid dispersant leaving magnetic nanoparticles densely packed*", as recited in claims 1 and 3. The combination of Begley and Howard therefore cannot teach each and every feature recited in claim 1 or 3. Accordingly, Applicant submits that the subject matter of those claims was not obvious at the time the invention was made to a person having ordinary skill in the art.

Regarding other claims

All the other claims depend directly or indirectly from claim 1 or claim 3 and contain all the limitations thereof. At least for this reason, the subject matter of these other claims was not obvious at the time the invention was made to a person having ordinary skill in the art. Moreover Applicant submits that these other claims recite features which are inventive *per se*.

Although Applicants may disagree with statements made by the Examiner in reference to the claims and the cited references, Applicants are not discussing all these statements in the current Office Action since reasons for the patentability of each pending claim are provided without addressing these statements. Therefore, Applicants reserve the right to address these statements at a later time if necessary.

No amendment made herein is related to the statutory requirements of patentability unless expressly stated herein. Further, no amendment herein is made for the purpose of narrowing the scope of any claim, unless Applicants have argued herein that such amendment was made to distinguish over a particular reference or combination of references.

In view of the amendments and remarks set forth herein, the application is believed to be in condition for allowance and a notice to that effect is solicited.

Nonetheless, should any issues remain that might be subject to resolution through a telephonic interview, the Examiner is requested to telephone the undersigned.

If Applicant has overlooked any additional fees, or if any overpayment has been made, the Commissioner is hereby authorized to credit or debit Deposit Account 503079.

Respectfully submitted,

SEND CORRESPONDENCE TO:

Freescale Semiconductor, Inc.
Law Department

Customer Number: 23125

By: /David G. Dolezal/

DAVID G. DOLEZAL
Attorney of Record
Reg. No.: 41,711
Telephone: (512) 996-6839
Fax No.: (512) 996-6854